



## SEQUENCE LISTING

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TECH CENTER 1600/2900

<110> HEALTH AND SCIENCES UNIVERSITY  
BURROWS, GREGORY G.  
VANDENBARK, ARTHUR A.

<120> RECOMBINANT MHC MOLECULES USEFUL FOR MANIPULATION OF ANTIGEN-SPECIFIC  
T-CELLS

<130> 899-58137

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<140> US 09/847,172

<141> 2001-05-01

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<150> US 09/153,586

<151> 1998-09-15

<150> US 60/064,555

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<150> US 60/064,552

<151> 1997-09-16

<160> 44

<170> PatentIn version 3.1

<210> 1

<211> 566

<212> DNA

<213> Rattus sp.

<220>

<221> CDS

<222> (3) .. (560)

<223>

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1 5 10 15

ctg tgc tac tac acc aac ggg acg cag cgc ata cgg gat gtg atc aga 95  
Leu Cys Tyr Tyr Thr Asn Gly Thr Gln Arg Ile Arg Asp Val Ile Arg  
20 25 30

tac atc tac aac cag gag gag tac ctg cgc tac gac agc gac gtg ggc 143  
Tyr Ile Tyr Asn Gln Glu Glu Tyr Leu Arg Tyr Asp Ser Asp Val Gly  
35 40 45

gag tac cgc gcg ctg acc gag ctg ggg cgg ccc tca gcc gag tac ttt 191  
Glu Tyr Arg Ala Leu Thr Glu Leu Gly Arg Pro Ser Ala Glu Tyr Phe  
50 55 60

aac aag cag tac ctg gag cag acg cgg gcc gag ctg gac acg gtc tgc 239  
 Asn Lys Gln Tyr Leu Glu Gln Thr Arg Ala Glu Leu Asp Thr Val Cys  
 65 70 75

aga cac aac tac gag ggg tcg gag gtc cgc acc tcc ctg cgg cgg ctt 287  
 Arg His Asn Tyr Glu Gly Ser Glu Val Arg Thr Ser Leu Arg Arg Leu  
 80 85 90 95

gga ggt caa gac gac att gag gcc gac cac gta gcc gcc tat ggt ata 335  
 Gly Gly Gln Asp Asp Ile Glu Ala Asp His Val Ala Ala Tyr Gly Ile  
 100 105 110

aat atg tat cag tat tat gaa tcc aga ggc cag ttc aca cat gaa ttt 383  
 Asn Met Tyr Gln Tyr Tyr Glu Ser Arg Gly Gln Phe Thr His Glu Phe  
 115 120 125

gat ggt gac gag gaa ttc tat gtg gac ttg gat aag aag gag acc atc 431  
 Asp Gly Asp Glu Glu Phe Tyr Val Asp Leu Asp Lys Lys Glu Thr Ile  
 130 135 140

tgg agg atc ccc gag ttt gga cag ctg aca agc ttt gac ccc caa ggt 479  
 Trp Arg Ile Pro Glu Phe Gly Gln Leu Thr Ser Phe Asp Pro Gln Gly  
 145 150 155

gga ctt caa aat ata gct ata ata aaa cac aat ttg gaa atc ttg atg 527  
 Gly Leu Gln Asn Ile Ala Ile Ile Lys His Asn Leu Glu Ile Leu Met  
 160 165 170 175

aag agg tca aat tca acc caa gct gtc aac taa ctcgag 566  
 Lys Arg Ser Asn Ser Thr Gln Ala Val Asn  
 180 185

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 20 25 30

Ile Tyr Asn Gln Glu Glu Tyr Leu Arg Tyr Asp Ser Asp Val Gly Glu  
 35 40 45

Tyr Arg Ala Leu Thr Glu Leu Gly Arg Pro Ser Ala Glu Tyr Phe Asn  
 50 55 60

Lys Gln Tyr Leu Glu Gln Thr Arg Ala Glu Leu Asp Thr Val Cys Arg  
65 70 75 80

His Asn Tyr Glu Gly Ser Glu Val Arg Thr Ser Leu Arg Arg Leu Gly  
85 90 95

Gly Gln Asp Asp Ile Glu Ala Asp His Val Ala Ala Tyr Gly Ile Asn  
100 105 110

Met Tyr Gln Tyr Tyr Glu Ser Arg Gly Gln Phe Thr His Glu Phe Asp  
115 120 125

Gly Asp Glu Glu Phe Tyr Val Asp Leu Asp Lys Lys Glu Thr Ile Trp  
130 135 140

Arg Ile Pro Glu Phe Gly Gln Leu Thr Ser Phe Asp Pro Gln Gly Gly  
145 150 155 160

Leu Gln Asn Ile Ala Ile Ile Lys His Asn Leu Glu Ile Leu Met Lys  
165 170 175

Arg Ser Asn Ser Thr Gln Ala Val Asn  
180 185

<210> 3  
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<220>  
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<220>  
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<222> (3) .. (113)  
<223>

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cc atg ggc aga gac tcc cca cag aag agc cag agg act cag gat gag 47  
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1 5 10 15  
  
aac cca gtg gtg cac ttc gga ggt gga ggc tca cta gtg ccc cga ggc 95  
Asn Pro Val Val His Phe Gly Gly Gly Gly Ser Leu Val Pro Arg Gly  
20 25 30  
  
tct gga ggt gga ggc tcc 113  
Ser Gly Gly Gly Gly Ser

<210> 4  
 <211> 37  
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<220>  
 <223> Antigen/linker insert

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 1 5 10 15

Pro Val Val His Phe Gly Gly Gly Gly Ser Leu Val Pro Arg Gly Ser  
 20 25 30

Gly Gly Gly Gly Ser  
 35

<210> 5  
 <211> 83  
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 1 5 10 15

acg acc cac tac ggt gga ggt gga ggc tca cta gtg 83  
 Thr Thr His Tyr Gly Gly Gly Gly Gly Ser Leu Val  
 20 25

<210> 6  
 <211> 27  
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<220>  
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e

<400> 6

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1 5 10 15

Thr His Tyr Gly Gly Gly Gly Gly Ser Leu Val  
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<213> Artificial Sequence

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<223> Alternative antigen encoding sequences for the expression cassett  
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<222> (3) .. (89)

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Met Gly Arg Asp Ser Lys Leu Glu Leu Gln Ser Ala Leu Glu Glu  
1 5 10 15

gct gaa gct tcc ctg gaa cac gga ggt gga ggc tca cta gtg 89  
Ala Glu Ala Ser Leu Glu His Gly Gly Gly Gly Ser Leu Val  
20 25

<210> 8

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Alternative antigen encoding sequences for the expression cassett  
e

<400> 8

Met Gly Arg Asp Ser Lys Leu Glu Leu Gln Ser Ala Leu Glu Glu Ala  
1 5 10 15

Glu Ala Ser Leu Glu His Gly Gly Gly Gly Ser Leu Val  
20 25

<210> 9

<211> 28  
 <212> DNA  
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 <223> PCR primer  
  
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 aattcctcga gatggctctg cagacccc 28

<210> 10  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 10  
 tcttgacctc caagccgccg cagggagggtg 30

<210> 11  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 11  
 cggcggcttg gaggtcaaga cgacattgag g 31

<210> 12  
 <211> 37  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 12  
 gcctcggtac cttagttgac agcttgggtt gaatttg 37

<210> 13  
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 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 13  
 cagggaccat gggcagagac tcccca 26

<210> 14  
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 <223> PCR primer  
  
 <400> 14  
 gcctcctcga gttagttgac agcttgggtt 30  
  
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 <212> DNA  
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 gaagtgcacc actgggttct catcctgagt cctctggctc ttctgtgggg agtctctgcc 120  
 ctcagtcc 128  
  
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 gctccccgcg ggatttcgtg taccagttca a 31  
  
 <210> 17  
 <211> 92  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 17  
 tattaccatg ggcagagact cctccggcaa ggattcgcac catgcggcgc ggacgaccca 60  
 ctacggtgga ggtggaggct cactagtgcc cc 92  
  
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<211> 92  
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<400> 18  
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ccttgccgga ggagtctctg cccatggtaa ta 92

<210> 19  
<211> 98  
<212> DNA  
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<400> 19  
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ttccctggaa cacggaggtg gaggtcact agtgcccc 98

<210> 20  
<211> 98  
<212> DNA  
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<220>  
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ggggcactag tgagcctcca cctccgtgtt ccaggggaagc ttcagcttct tccagagcgg 60  
actgcagttc cagtttggag tctctgcca tggttaata 98

<210> 21  
<211> 184  
<212> PRT  
<213> Homo sapiens

<400> 21

Gly Ser His Ser Met Arg Tyr Phe Tyr Thr Ala Met Ser Arg Pro Gly  
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Arg Gly Glu Pro Arg Phe Ile Ala Val Gly Tyr Val Asp Asp Thr Gln  
20 25 30

Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro Arg Thr Glu Pro Arg

35

40

45

Pro Pro Trp Ile Glu Gln Glu Gly Pro Glu Tyr Trp Asp Arg Asn Thr  
50 55 60

Gln Ile Phe Lys Thr Asn Thr Gln Thr Tyr Arg Glu Asn Leu Arg Ile  
65 70 75 80

Ala Leu Arg Tyr Tyr Asn Gln Ser Glu Ala Gly Ser His Ile Ile Gln  
85 90 95

Arg Met Tyr Gly Cys Asp Leu Gly Pro Asp Gly Arg Leu Leu Arg Gly  
100 105 110

His Asp Gln Ser Ala Tyr Asp Gly Lys Asp Tyr Ile Ala Leu Asn Glu  
115 120 125

Asp Leu Ser Ser Trp Thr Ala Ala Asp Thr Ala Ala Gln Ile Thr Gln  
130 135 140

Arg Lys Trp Glu Ala Ala Arg Val Ala Glu Gln Leu Arg Ala Tyr Leu  
145 150 155 160

Glu Gly Leu Cys Val Glu Trp Leu Arg Arg Tyr Leu Glu Asn Gly Lys  
165 170 175

Glu Thr Leu Gln Arg Ala Asp Pro  
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<210> 22

<211> 174

<212> PRT

<213> Homo sapiens

<400> 22

Arg Pro Arg Phe Leu Trp Gln Leu Lys Phe Glu Cys His Phe Phe Asn  
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Gly Thr Glu Arg Val Arg Leu Leu Glu Arg Cys Ile Tyr Asn Gln Glu  
20 25 30

Glu Ser Val Arg Phe Asp Ser Asp Val Gly Glu Tyr Arg Ala Val Thr  
35 40 45

Glu Leu Gly Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln Lys Asp Leu  
50 55 60

Leu Glu Gln Arg Arg Ala Ala Val Asp Thr Tyr Cys Arg His Asn Tyr  
65 70 75 80

Gly Val Gly Glu Ser Phe Thr Val Gln Arg Arg Val Glu Glu His Val  
85 90 95

Ile Ile Gln Ala Glu Phe Tyr Leu Asn Pro Asp Gln Ser Gly Glu Phe  
100 105 110

Met Phe Asp Phe Asp Gly Asp Glu Ile Phe His Val Asp Met Ala Lys  
115 120 125

Lys Glu Thr Val Trp Arg Leu Glu Glu Phe Gly Arg Phe Ala Ser Phe  
130 135 140

Glu Ala Gln Gly Ala Leu Ala Asn Ile Ala Val Asp Lys Ala Asn Leu  
145 150 155 160

Glu Ile Met Thr Lys Arg Ser Asn Tyr Thr Pro Ile Thr Asn  
165 170

<210> 23  
<211> 174  
<212> PRT  
<213> Mus sp.

<400> 23

Arg Pro Trp Phe Leu Glu Tyr Cys Lys Ser Glu Cys His Phe Tyr Asn  
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Gly Thr Gln Arg Val Arg Leu Leu Val Arg Tyr Phe Tyr Asn Leu Glu  
20 25 30

Glu Asn Leu Arg Phe Asp Ser Asp Val Gly Glu Phe Arg Ala Val Thr  
35 40 45

Glu Leu Gly Arg Pro Asp Ala Glu Asn Trp Asn Ser Gln Pro Glu Phe  
50 55 60

Leu Glu Gln Lys Arg Ala Glu Val Asp Thr Val Cys Arg His Asn Tyr

65		70		75		80
Glu Ile Phe Asp Asn Phe Leu Val Pro Arg Arg Val Glu Glu His Thr						
	85			90		95
Ile Ile Gln Ala Glu Phe Tyr Leu Leu Pro Asp Lys Arg Gly Glu Phe						
	100		105			110
Met Phe Asp Phe Asp Gly Asp Glu Ile Phe His Val Asp Ile Glu Lys						
	115		120			125
Ser Glu Thr Ile Trp Arg Leu Glu Glu Phe Ala Lys Phe Ala Ser Phe						
	130		135			140
Glu Ala Gln Gly Ala Leu Ala Asn Ile Ala Val Asp Lys Ala Asn Leu						
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Asp Val Met Lys Glu Arg Ser Asn Asn Thr Pro Asp Ala Asn						
	165			170		
<210> 24						
<211> 180						
<212> PRT						
<213> Rattus sp.						
<400> 24						
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Cys Tyr Tyr Thr Asn Gly Thr Gln Arg Ile Arg Asp Val Ile Arg Tyr						
	20			25		30
Ile Tyr Asn Gln Glu Glu Tyr Leu Arg Tyr Asp Ser Asp Val Gly Glu						
	35		40			45
Tyr Arg Ala Leu Thr Glu Leu Gly Arg Pro Ser Ala Glu Tyr Trp Asn						
	50		55			60
Ser Gln Lys Gln Tyr Leu Glu Gln Thr Arg Ala Glu Leu Asp Thr Val						
65		70		75		80
Cys Arg His Asn Tyr Glu Gly Ser Glu Val Arg Thr Ser Leu Arg Arg						
	85			90		95

Leu Ala Asp His Val Ala Ala Tyr Gly Ile Asn Met Tyr Gln Tyr Tyr  
100 105 110

Glu Ser Arg Gly Gln Phe Thr His Glu Phe Asp Gly Asp Glu Glu Phe  
115 120 125

Tyr Val Asp Leu Asp Lys Lys Glu Thr Ile Trp Arg Ile Pro Glu Phe  
130 135 140

Gly Gln Leu Thr Ser Phe Asp Pro Gln Gly Gly Leu Gln Asn Ile Ala  
145 150 155 160

Ile Ile Lys His Asn Leu Glu Ile Leu Met Lys Arg Ser Asn Ser Thr  
165 170 175

Gln Ala Val Asn  
180

<210> 25  
<211> 19  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Artificial peptide

<400> 25

Gly Ser Leu Pro Gln Lys Ser Gln Arg Ser Gln Asp Glu Asn Pro Val  
1 5 10 15

Val His Phe

<210> 26  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Artificial peptide

<400> 26

Ser Gly Lys Asp Ser His His Ala Ala Arg Thr Thr His Tyr Gly  
1 5 10 15

<210> 27  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Artificial peptide

<400> 27

Lys Leu Glu Leu Gln Ser Ala Leu Glu Glu Ala Glu Ala Ser Leu Glu  
1 5 10 15

His

<210> 28  
<211> 95  
<212> DNA  
<213> Artificial Sequence

<220>  
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ggcgcacttc ggaggtggag gctcactagt gcccc 95

<210> 29  
<211> 94  
<212> DNA  
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<220>  
<223> PCR primer

<400> 29  
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ggctcttctg tggggagtct ctgcccatgg taat 94

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<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 30

Gly Ser Leu Pro Gln Lys Ser Gln Arg Thr Gln Asp Glu Asn Pro Val

1

5

10

15

Val His Phe

&lt;210&gt; 31

&lt;211&gt; 29

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; PCR primer

&lt;400&gt; 31

attaccatgg gggacacccg accacgttt

29

&lt;210&gt; 32

&lt;211&gt; 45

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; PCR primer

&lt;400&gt; 32

ggatgatcac atgttcttct ttgatgactc gccgctgcac tgtga

45

&lt;210&gt; 33

&lt;211&gt; 45

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; PCR primer

&lt;400&gt; 33

tcacagtgcg gcggcgagtc atcaaagaag aacatgtgat catcc

45

&lt;210&gt; 34

&lt;211&gt; 37

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; PCR primer

&lt;400&gt; 34

tggtgctcga gttaattggg gatcggagta tagttgg

37

&lt;210&gt; 35

&lt;211&gt; 20

<212> DNA  
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 <210> 36  
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 <212> DNA  
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 ccccatggta at 132  
  
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 <212> DNA  
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 <223> PCR primer

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tcaaagtcaa acataaactc gc 22

<210> 40  
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<212> DNA  
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<400> 40  
gcgagtttat gtttgacttt ga 22

<210> 41  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Artificial peptide

<400> 41  
Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg  
1 5 10 15

<210> 42  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Artificial peptide

<400> 42  
Ala Thr Gly Phe Lys Gln Ser Ser Lys Ala Leu Gln Arg Pro Val Ala  
1 5 10 15

Ser

<210> 43  
<211> 641  
<212> DNA  
<213> Homo sapiens

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<222> (3) .. (635)

<223>

<400> 43

cc atg ggg gac acc cga gaa aac ccg gtt gtt cac ttc ttc aaa aac	47
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1 5 10 15	
atc gtt acc ccg cgt gga ggt gga ggc tca cta gtg ccc cga ggc tct	95
Ile Val Thr Pro Arg Gly Gly Gly Gly Ser Leu Val Pro Arg Gly Ser	
20 25 30	
gga ggt gga ggc cca cgt ttc ctg tgg cag cct aag agg gag tgt cat	143
Gly Gly Gly Gly Pro Arg Phe Leu Trp Gln Pro Lys Arg Glu Cys His	
35 40 45	
ttc ttc aat ggg acg gag cgg gtg cgg ttc ctg gac aga tac ttc tat	191
Phe Phe Asn Gly Thr Glu Arg Val Arg Phe Leu Asp Arg Tyr Phe Tyr	
50 55 60	
aac cag gag gag tcc gtg cgc ttc gac agc gac gtg ggg gag ttc cgg	239
Asn Gln Glu Glu Ser Val Arg Phe Asp Ser Asp Val Gly Glu Phe Arg	
65 70 75	
gcg gtg acg gag ctg ggg cgg cct gac gct gag tac tgg aac agc cag	287
Ala Val Thr Glu Leu Gly Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln	
80 85 90 95	
aag gac atc ctg gag cag gcg cgg gcc gcg gtg gac acc tac tgc aga	335
Lys Asp Ile Leu Glu Gln Ala Arg Ala Val Asp Thr Tyr Cys Arg	
100 105 110	
cac aac tac ggg gtt gtg gag agc ttc aca gtg cag cgg cga gtc atc	383
His Asn Tyr Gly Val Val Glu Ser Phe Thr Val Gln Arg Arg Val Ile	
115 120 125	
aaa gaa gaa cat gtg atc atc cag gcc gag ttc tat ctg aat cct gac	431
Lys Glu Glu His Val Ile Ile Gln Ala Glu Phe Tyr Leu Asn Pro Asp	
130 135 140	
caa tca ggc gag ttt atg ttt gac ttt gat ggt gat gag att ttc cat	479
Gln Ser Gly Glu Phe Met Phe Asp Phe Asp Gly Asp Glu Ile Phe His	
145 150 155	
gtg gat atg gca aag aag gag acg gtc tgg cgg ctt gaa gaa ttt gga	527
Val Asp Met Ala Lys Lys Glu Thr Val Trp Arg Leu Glu Glu Phe Gly	
160 165 170 175	
cga ttt gcc agc ttt gag gct caa ggt gca ttg gcc aac ata gct gtg	575
Arg Phe Ala Ser Phe Glu Ala Gln Gly Ala Leu Ala Asn Ile Ala Val	
180 185 190	
gac aaa gcc aac ttg gaa atc atg aca aag cgc tcc aac tat act ccg	623
Asp Lys Ala Asn Leu Glu Ile Met Thr Lys Arg Ser Asn Tyr Thr Pro	
195 200 205	
atc acc aat taa ctcgag	641

Ile Thr Asn  
210

<210> 44  
<211> 210  
<212> PRT  
<213> Homo sapiens

<400> 44

Met Gly Asp Thr Arg Glu Asn Pro Val Val His Phe Phe Lys Asn Ile  
1 5 10 15

Val Thr Pro Arg Gly Gly Gly Gly Ser Leu Val Pro Arg Gly Ser Gly  
20 25 30

Gly Gly Gly Pro Arg Phe Leu Trp Gln Pro Lys Arg Glu Cys His Phe  
35 40 45

Phe Asn Gly Thr Glu Arg Val Arg Phe Leu Asp Arg Tyr Phe Tyr Asn  
50 55 60

Gln Glu Glu Ser Val Arg Phe Asp Ser Asp Val Gly Glu Phe Arg Ala  
65 70 75 80

Val Thr Glu Leu Gly Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln Lys  
85 90 95

Asp Ile Leu Glu Gln Ala Arg Ala Ala Val Asp Thr Tyr Cys Arg His  
100 105 110

Asn Tyr Gly Val Val Glu Ser Phe Thr Val Gln Arg Arg Val Ile Lys  
115 120 125

Glu Glu His Val Ile Ile Gln Ala Glu Phe Tyr Leu Asn Pro Asp Gln  
130 135 140

Ser Gly Glu Phe Met Phe Asp Phe Asp Gly Asp Glu Ile Phe His Val  
145 150 155 160

Asp Met Ala Lys Lys Glu Thr Val Trp Arg Leu Glu Glu Phe Gly Arg  
165 170 175

Phe Ala Ser Phe Glu Ala Gln Gly Ala Leu Ala Asn Ile Ala Val Asp  
180 185 190

Lys Ala Asn Leu Glu Ile Met Thr Lys Arg Ser Asn Tyr Thr Pro Ile  
195 200 205

Thr Asn  
210